
COMPLETE **line**

# Power reliability

## Protection, conversion, monitoring, and distribution

PHOENIX CONTACT
INSPIRING INNOVATIONS

# Cabinet Confidence

## Your trusted partner for the control cabinet

From connectivity to control, Phoenix Contact gives you the confidence you need in your production systems. Our longstanding commitment to quality and innovation will give you the peace of mind and competitive edge to succeed in today's highly complex manufacturing world.

NETWORKING

AUTOMATION AND CONTROL

SIGNAL SWITCHING AND CONDITIONING

CONNECTIVITY

SAFETY

SHOP FLOOR PRODUCTIVITY

LIMITED LIFETIME WARRANTY

BUILD WITH CONFIDENCE

# Power reliability

Don't overlook the basics. Power touches every aspect of a control system, and logic platforms are dependent on proper power and protection. No matter how sophisticated your control system, a "line down" situation is only one power disturbance away.

True power reliability involves protection against surges and over-currents, conversion of AC to DC while providing redundancy and battery back-up, monitoring for faults, and distributing power to the end-devices. Combined, these four elements provide the foundation on which reliable control systems should be built.

**POWER RELIABILITY**

- **Protection**
- **Conversion**
- **Monitoring**
- **Distribution**

## Contents



Protection

Conversion

Monitoring

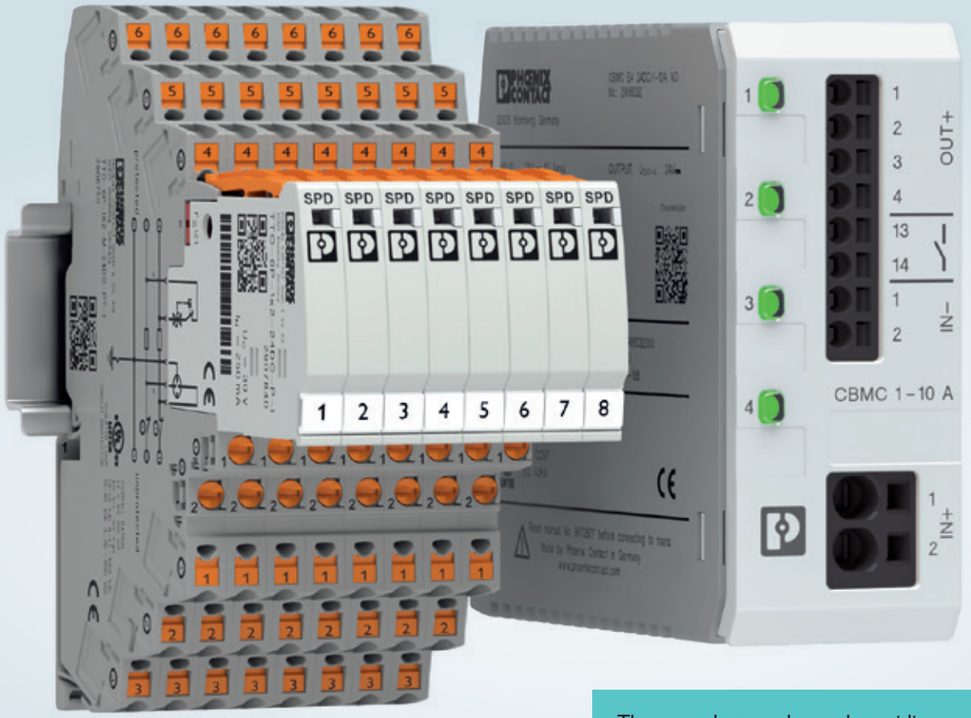
Distribution

# Protection

## Surge and overcurrent protection for increased system reliability

Maximizing the reliability of systems to maintain uptime is more imperative than ever before. Applications that generate revenue and involve human safety demand operational integrity, and require protection from transient surges and overcurrent conditions that can interrupt such processes.

Surge protective devices and circuit breakers from Phoenix Contact address these critical needs through a wide range of products with industry-leading features to enable data-driven decisions.




These products go beyond providing your applications with the most reliable protection available, as they enable real-time feedback on system status. With Phoenix Contact surge and overcurrent protection, you can trust in the reliability of your systems.



## Surge protection devices

Offering a wide range of world-class circuit protection, Phoenix Contact has the right product for any application. From first-in-class spark-gap technology to innovative 3-stage status indication, we can protect everything from data and signals to entire power systems.


## Circuit breakers

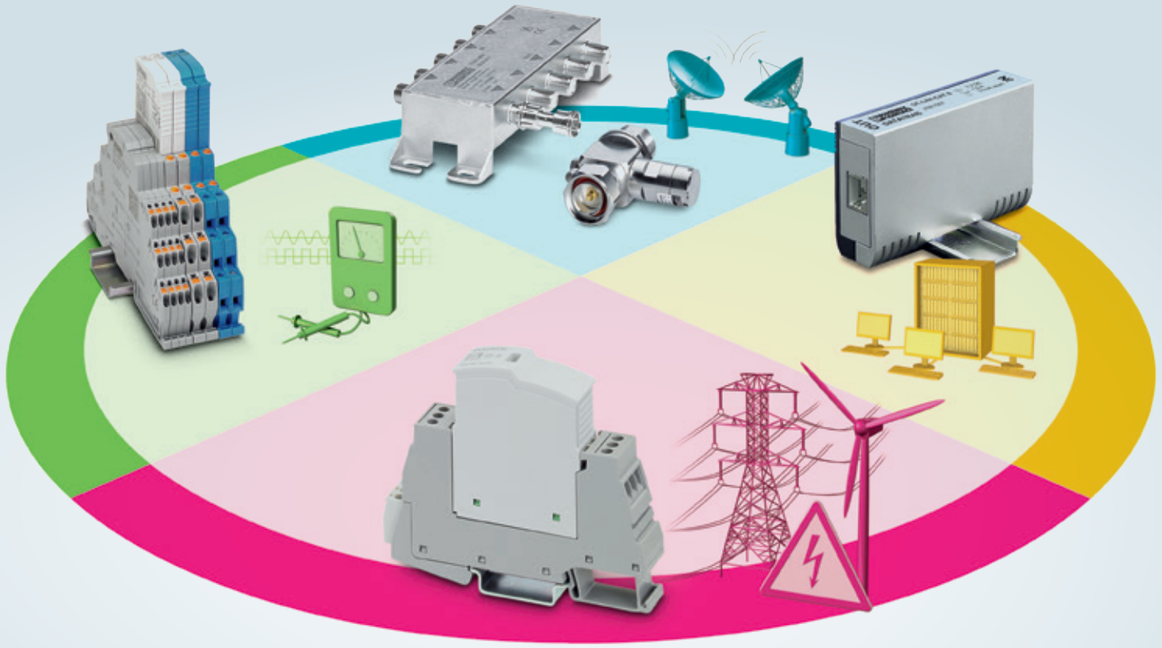
Having the ability to remove a faulty circuit quickly is imperative to maintaining the uptime of your system. Phoenix Contact offers a wide variety of circuit protection products for short circuits and thermal overloads. Circuit breakers easily integrate protection into your control system, improving overall operational efficiency and system reliability.

Protection

# Surge protection devices

When identifying the necessary surge protection for your application, it is important to consider the Circle of Protection (CoP). This concept allows you to define the application you want to protect, evaluate threats from each conductor, and decide on the appropriate types of surge protection. Threats from transients can be mitigated with the following four types of Surge Protection Devices (SPDs):

- Power SPDs – high-performance surge protection for power systems
- Data SPDs – loss-less surge protection for data and communication lines
- Signal SPDs – surge protection for analog and digital signals
- Coaxial SPDs – surge protection for wireless antennas and coaxial systems



## Power SPDs

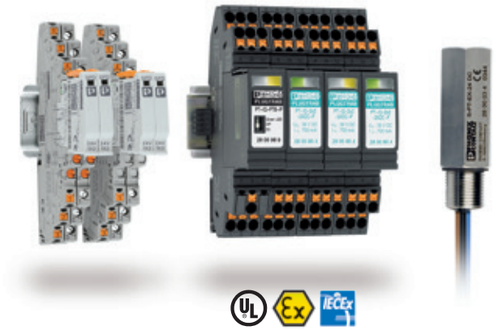
- ☑ UL Listed for easy integration into your systems
- ☑ Hot-swappable, pluggable design for easy maintenance
- ☑ Local and remote status indication to monitor the protection status
- ☑ 200 kA SCCR enables use in virtually any system
- ☑ Available for all standard U.S. voltage systems

## Data SPDs

- ☑ Up to 10 Gbit/s without signal degradation
- ☑ PoE++ applications up to 72 W for high power applications
- ☑ Multiple connection styles to suit a variety of applications
- ☑ Protection on all modes to ensure protection on both data and power conductors

## Signal SPDs

- ☑ World's thinnest SPD at 3.5 mm for high density requirements
- ☑ Unique 3-stage SPD health status indication
- ☑ Hot-swappable, pluggable design for easy maintenance
- ☑ Local and remote status indication to monitor protection status



## Coaxial SPDs

- ☑ Multiple frequency ranges to suit the application
- ☑ Fine protection levels for the most sensitive equipment
- ☑ Variety of connection types to address different termination needs
- ☑ Maintenance-free with LAMDA/4 technology or replaceable GDT versions

Protection

# Circuit breakers

Having the ability to remove a faulty circuit quickly is imperative to maintaining the uptime of your systems. Phoenix Contact offers a wide variety of circuit protection products designed to mitigate the effects of short circuit and thermal overload conditions.

These products are based on one of four different tripping technologies.

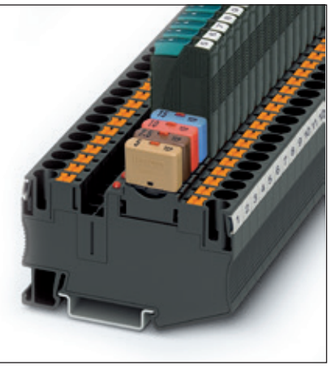
- Electronic – highly robust DC overcurrent protection
- Thermal – cost-effective thermal overload technology
- Thermal-magnetic – traditional breaker technology for general purpose applications
- Hydraulic-magnetic – rugged design for hazardous locations and harsh environments


## Electronic

- UL 508 Listed for easy integration into your systems
- Programmable versions reduce inventory requirements
- Remote reset and on/off control enables easy automation of systems
- Power-dense, multi-channel versions save cabinet space
- NEC Class 2 and hazardous location (Class I, Division 2) approvals for demanding environments

## Thermal

- UL 1077 Recognized supplementary protectors
- Highly compact design saves valuable cabinet space
- For use with a wide variety of terminal blocks
- Pluggable design enables easy modifications of breaker amperages
- Eliminates need for replaceable fuses
- Makes troubleshooting circuits easier
- Available for up to 250 V AC/65 V DC



## Thermal-magnetic

- UL 489 Listed for branch circuit protection
- UL 508 Listed cuttable busbars for maximum flexibility
- Snap-action technology increases the lifespan of the product
- Trip-free design ensures safe operation of the breakers
- Accessory modules for auxiliary contacts, remote shunting, and alarm contacts

## Hydraulic-magnetic

- UL 1077 Recognized supplementary protectors
- UL approved for 120 V AC/50 V DC AC Class I, Division 2 applications
- Available up to 15 A
- T-bus power distribution bus reduces wiring time
- Durable housing and wide temperature range allow for use in harsh environments

# Common products for protection

| Surge protection | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A. What type of protection do you need? Power (24 V), loop (4/20 mA, 0-10 V), or discrete (binary 12 V, 24 V)?** | | | | | | | |
| **B. Do you require a push-in, screw, RJ45, N-type, or D-SUB connection?** | | | | | | | |
| **C. What is the voltage required?** | | | | | | | |
| **D. Will you use direct or indirect signal ground?** | | | | | | | |
| **E. Which design? Pluggable or non-pluggable?** | | | | | | | |
| **F. With or without status monitoring?** | | | | | | | |
| **G. Resulting Phoenix Contact part number** | | | | | | | |
| **A. Protection** | **B. Connection** | **C. Voltage** | **D. Grounding** | **E. Design** | **F. Monitoring** | **Type description** | **G. Order #** |
| **Power SPDs (PLT-SEC series)** | | | | | | | |
| Power | Screw | 24 V AC/DC | Direct | Pluggable | With | PLT-SEC-T3-24-FM-UT | 2907916 |
| | Screw | 120 V AC/150 V DC | Direct | Pluggable | With | PLT-SEC-T3-120-FM-UT | 2907918 |
| | Screw | 240 V AC/DC | Direct | Pluggable | With | PLT-SEC-T3-230-FM-UT | 2907919 |
| **Power SPDs (VAL-US series)** | | | | | | | |
| Power | Screw | 48 V DC | Direct | Pluggable | With | VAL-US-48/65/1+1V-FM | 2910346 |
| | Screw | 120 V AC | Direct | Pluggable | With | VAL-US-120/65/1+1-FM | 2910356 |
| | Screw | 120/240 V AC | Direct | Pluggable | With | VAL-US-120/65/2+1-FM | 2910358 |
| | Screw | 120/208 V AC | Direct | Pluggable | With | VAL-US-120/40/3+1-FM | 2910354 |
| | Screw | 120/208 V AC | Direct | Pluggable | With | VAL-US-120/65/3+1-FM | 2910360 |
| | Screw | 277/480 V AC | Direct | Pluggable | With | VAL-US-277/40/3+1-FM | 2910374 |
| | Screw | 277/480 V AC | Direct | Pluggable | With | VAL-US-277/80/3+1V-FM | 2910379 |
| | Screw | 480 V AC | Direct | Pluggable | With | VAL-US-480D/30/3+0-FM | 2910386 |
| | Screw | 600 V AC | Direct | Pluggable | With | VAL-US-600D/30/3+0-FM | 2910391 |
| **Data SPDs (DT series)** | | | | | | | |
| Discrete | RJ45 | <3.3 V DC | Direct | Non-pluggable | Without | DT-LAN-CAT.6+ | 2881007 |
| | | 12 V DC | Direct | Non-pluggable | Without | DT-UFB-485/BS | 2920612 |
| | | 185 V DC/130V AC | Direct | Non-pluggable | Without | DT-TELE-SHDSL | 2801593 |
| | | 185 V DC/130V AC | Direct | Non-pluggable | Without | DT-TELE-RJ45 | 2882925 |
| | D-SUB | 15 V DC/10V AC | Direct | Non-pluggable | Without | DT-UFB-V24/S-9-SB | 2803069 |
| | | 5.8 V DC | Direct | Non-pluggable | Without | DT-UFB-IB-RB0 | 2800056 |
| **Signal SPDs (PT-IQ series)** | | | | | | | |
| - | Screw | 24V DC | - | Pluggable | With | PT-IQ-PTB-UT | 2800768 |
| - | Push-in | 24V DC | - | Pluggable | With | PT-IQ-PTB-PT | 2801296 |
| Discrete | Screw | 24V DC | Direct | Pluggable | With | PT-IQ-2X2-24DC-UT | 2800980 |
| | | | Indirect | Pluggable | With | PT-IQ-2X2+F-24DC-UT | 2800981 |
| | Push-in | 24V DC | Direct | Pluggable | With | PT-IQ-2X2-24DC-PT | 2801263 |
| | | | Indirect | Pluggable | With | PT-IQ-2X2+F-24DC-PT | 2801264 |
| Analog loop | Screw | 24V DC | Direct | Pluggable | With | PT-IQ-4X1-24DC-UT | 2800982 |
| | Push-in | 24V DC | Direct | Pluggable | With | PT-IQ-4X1-24DC-PT | 2801271 |
| | | | Direct | Pluggable | With | PT-IQ-4X1+F-24DC-PT | 2801272 |
| **Signal SPDs (TTC series)** | | | | | | | |
| Analog loop | Screw | 24 V DC | Indirect | Pluggable | With | TTC-6P-1X2-F-M-24DC-UT-I | 2906781 |
| | Screw | 24 V DC | Direct | Non-pluggable | With | TTC-6-1X2-24DC-UT | 2906798 |
| | Push-in | 24 V DC | Indirect | Pluggable | With | TTC-6P-1X2-F-M-24DC-PT-I | 2906790 |
| | Push-in | 24 V DC | Direct | Non-pluggable | With | TTC-6-1X2-24DC-PT | 2906804 |
| Discrete | Screw | 24 V DC | Indirect | Pluggable | With | TTC-6P-2X1-F-M-24DC-UT-I | 2906784 |
| | Screw | 24 V DC | Direct | Non-pluggable | With | TTC-6-2X1-24DC-UT | 2906799 |
| | Push-in | 24 V DC | Indirect | Pluggable | With | TTC-6P-2X1-F-M-24DC-PT-I | 2906794 |
| | Push-in | 24 V DC | Direct | Non-pluggable | With | TTC-6-2X1-24DC-PT | 2906805 |
| **Coaxial SPDs (CN series)** | | | | | | | |
| Discrete | N-type | <55 Vp Core-ground | Direct | Non-pluggable | Without | CN-LAMBDA/4-0.47-BB | 2800021 |
| | | <18 Vp Core-ground | Direct | Non-pluggable | Without | CN-LAMBDA/4-2.25-BB | 2801057 |
| | | <11 Vp Core-ground | Direct | Non-pluggable | Without | CN-LAMBDA/4-5.9-BB | 2838490 |
| | | 280 DC | Direct | Non-pluggable | Without | CN-UB-280DC-3-BB | 2801050 |

Power SPDs

Data and signal SPDs

Electronic CBs

Thermal-magnetic CBs

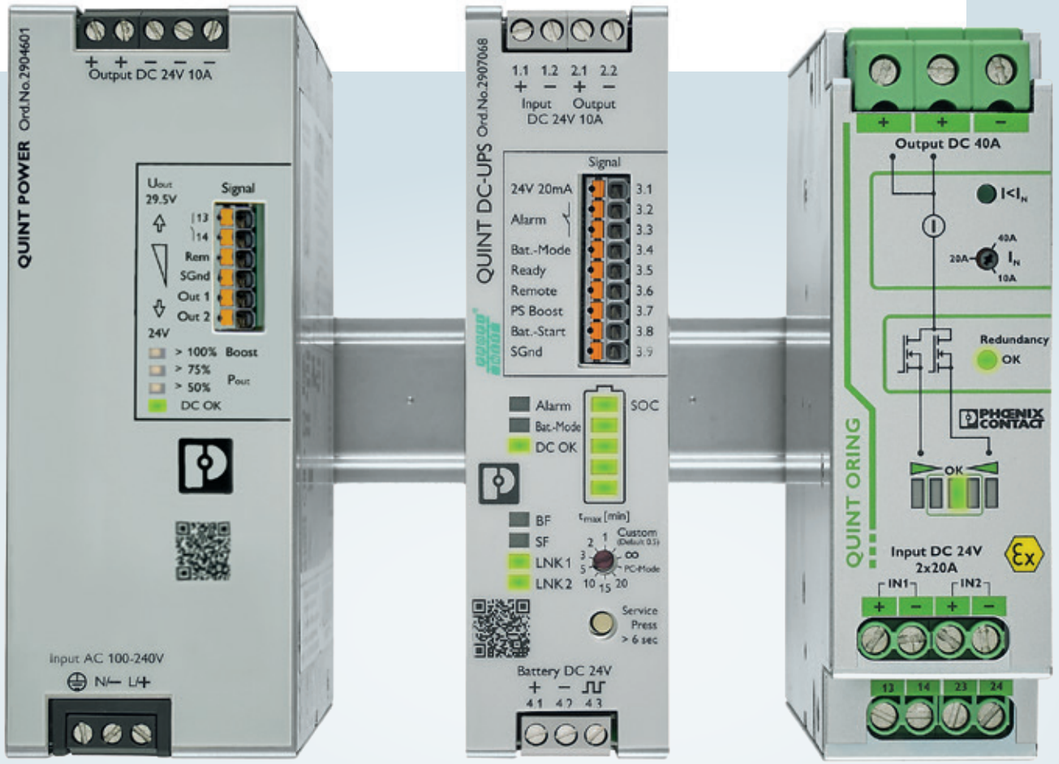
| Circuit breakers | | | | | | |
|---|---|---|---|---|---|---|
| **A. UL approval?** | | | **D. What voltage rating is required?** | | | |
| **B. How many poles are required?** | | | **E. What ampere rating is required?** | | | |
| **C. What trip curve characteristic is required?** | | | **F. Resulting Phoenix Contact part number** | | | |
| **A. UL** | **B. # of poles** | **C. Trip curve** | **D. Voltage rating** | **E. Ampere rating** | **Type description** | **F. Order #** |
| **Electronic (CBM, CBMC, and PTCB series)** | | | | | | |
| UL 2367 and UL 508 | 1 (x8) | Electronic | 24V DC | 0.5-10 | CBM E8 24DC/0.5-10A NO-R | 2905744 |
| | 1 (x4) | | 24V DC | 1-10 | CBMC E4 24DC/1-10A NO | 2906032 |
| | 1 (x4) | | 24V DC | 1-10 | CBMC E4 24DC/1-10A IOL | 2910411 |
| | 1 (x4) | | 24V DC | 1-4 | CBMC E4 24DC/1-4A NO | 2906031 |
| | 1 (x4) | | 24V DC | 1-4 | CBMC E4 24DC/1-4A+ IOL | 2910410 |
| | 1 | | 24V DC | 1-3 | PTCB E1 24DC/1-3A NO | 2909909 |
| | 1 | | 24V DC | 1-8 | PTCB E1 24DC/1-8A NO | 2908262 |
| | 1 | | 24V DC | 3 | PTCB E1 24DC/3A NO | 2909904 |
| | 1 | | 24V DC | 6 | PTCB E1 24DC/6A NO | 2909908 |
| **Thermal (TCP series)** | | | | | | |
| UL 1077 | 1 | Thermal | 250V AC/72V DC | 0.5 | TCP 0,5A | 0712152 |
| | | | 250V AC/72V DC | 1 | TCP 1A | 0712194 |
| | | | 250V AC/72V DC | 2 | TCP 2A | 0712217 |
| | | | 250V AC/72V DC | 3 | TCP 3A | 0712233 |
| | | | 250V AC/72V DC | 4 | TCP 4A | 0712259 |
| | | | 250V AC/72V DC | 6 | TCP 6A | 0712275 |
| | | | 250V AC/72V DC | 10 | TCP 10A | 0712314 |
| **Thermal-magnetic (TMC 7 and TMC 8 series)** | | | | | | |
| UL 1077 | 1 | B | 277V AC/60V DC | 5 | TMC 71B 05A | 1019912 |
| | | | 277V AC/60V DC | 10 | TMC 71B 10A | 1019916 |
| | | | 277V AC/60V DC | 30 | TMC 71B 30A | 1019923 |
| | | C | 277V AC/60V DC | 1 | TMC 71C 01A | 1019972 |
| | | | 277V AC/60V DC | 2 | TMC 71C 02A | 1019973 |
| | | | 277V AC/60V DC | 3 | TMC 71C 03A | 1019974 |
| | | | 277V AC/60V DC | 4 | TMC 71C 04A | 1019975 |
| | | | 277V AC/60V DC | 5 | TMC 71C 05A | 1019976 |
| | | | 277V AC/60V DC | 10 | TMC 71C 10A | 1019980 |
| | | | 277V AC/60V DC | 15 | TMC 71C 15A | 1019983 |
| | | | 277V AC/60V DC | 20 | TMC 71C 20A | 1019985 |
| | | D | 277V AC/60V DC | 5 | TMC 71D 05A | 1020041 |
| | | | 277V AC/60V DC | 10 | TMC 71D 10A | 1020045 |
| | | | 277V AC/60V DC | 25 | TMC 71D 25A | 1020053 |
| UL 1077 | 2 | C | 277V AC/125V DC | 10 | TMC 72C 10A | 1020002 |
| UL 1077 | 3 | C | 277V AC | 15 | TMC 73C 15A | 1020026 |
| UL 489 | 1 | B | 277V AC/60V DC | 5 | TMC 81B 05A | 2907482 |
| | | | 277V AC/60V DC | 10 | TMC 81B 10A | 2907487 |
| | | | 277V AC/60V DC | 30 | TMC 81B 30A | 2907494 |
| | | C | 277V AC/60V DC | 1 | TMC 81C 01A | 2907558 |
| | | | 277V AC/60V DC | 2 | TMC 81C 02A | 2907559 |
| | | | 277V AC/60V DC | 3 | TMC 81C 03A | 2907560 |
| | | | 277V AC/60V DC | 4 | TMC 81C 04A | 2907561 |
| | | | 277V AC/60V DC | 5 | TMC 81C 05A | 2907562 |
| | | | 277V AC/60V DC | 6 | TMC 81C 06A | 2907563 |
| | | | 277V AC/60V DC | 10 | TMC 81C 10A | 2907566 |
| | | | 277V AC/60V DC | 15 | TMC 81C 15A | 2907571 |
| | | | 277V AC/60V DC | 20 | TMC 81C 20A | 2907573 |
| | | | 277V AC/60V DC | 40 | TMC 81C 40A | 2907578 |
| | | D | 277V AC/60V DC | 2 | TMC 81D 02A | 2907627 |
| | | | 277V AC/60V DC | 5 | TMC 81D 05A | 2907630 |
| | | | 277V AC/60V DC | 10 | TMC 81D 10A | 2907634 |
| | | | 277V AC/60V DC | 25 | TMC 81D 25A | 2907641 |
| UL 489 | 2 | C | 277V AC/125V DC | 10 | TMC 82C 10A | 2907591 |
| | | D | 277V AC/125V DC | 2 | TMC 82D 02A | 2907652 |
| UL 489 | 3 | C | 277V AC | 15 | TMC 83C 15A | 2907618 |
| **Hydraulic-magnetic (HMC series)** | | | | | | |
| UL 1077 | 1 | Multi-frequency short time delay | 120V AC/50V DC | 5 | HMC 11 120AC 5A C1D2 | 2907194 |
| | | | 120V AC/50V DC | 7.5 | HMC 11 120AC 7.5A C1D2 | 2907195 |
| | | | 120V AC/50V DC | 10 | HMC 11 120AC 10A C1D2 | 2907196 |
| | | | 120V AC/50V DC | 15 | HMC 11 120AC 15A C1D2 | 2907197 |
| | | DC short time delay | 50V DC | 20 | HMC 11 50DC 20A C1D2 | 2907199 |

# Conversion

## Power for superior system availability

Phoenix Contact's POWER products supply your applications with leading technology and high quality. Power supplies, DC/DC converters, redundancy modules, and uninterruptible power supplies are optimally tailored in design and functionality to the requirements of various industries.

With our QUINT, TRIO, and UNO product ranges, you are equipped to choose a basic, standard, or critical device for your application. These products have attributes and price points to fit any application.




AC/DC power supplies, DC/DC converters, redundancy modules, and uninterruptible power supplies are the heart of the control cabinet and must be reliably maintained. Phoenix Contact designs these power solutions to meet all the levels of form, feature, and functionality an application may require.



## AC/DC power supplies

Our power supplies can be used in the widest range of areas and industries. With various functionalities, performance classes, and designs, they are the perfect partner for your application.

## DC/DC converters

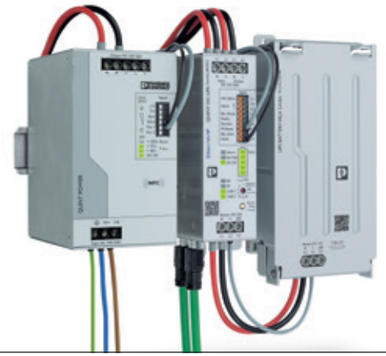
DC/DC converters prevent faults in your application. Even in the case of long cable lengths, the load is always supplied with a controlled DC voltage. DC/DC converters not only convert voltage, but also isolate, amplify, and regulate voltage within the control cabinet.

## Redundancy modules

In applications with the highest demands regarding operational reliability, redundant power supply solutions are necessary. They prevent failure of a power supply unit leading to a loss of redundancy.

## Uninterruptible power supplies and battery backup

Mains interruptions can have serious consequences. You can rely on our uninterruptible power supplies for power security. We offer both DC and AC uninterruptible power supplies (UPS) and various battery backup solutions that can be used in the event of mains failures.



Conversion

# Power supplies

**A comparison of the advantages**

The product ranges differ with regard to their design, power, and functionality. Select the ideal solution based on your requirements. Our goal is to ensure the maximum availability of your system.

- QUINT POWER – powerful with critical functionality
- TRIO POWER – robust with standard functionality
- UNO POWER – compact with basic functionality


## QUINT POWER – Powerful with critical functionality

- Rugged design for critical applications
- Permanent power boost of up to 125 percent
- Dynamic power boost to start heavy loads
- Advanced monitoring capabilities
- Breaker tripping pulse to avoid oversizing
- Coordinated surge protection on the input

## TRIO POWER – Robust with standard functionality

- Slim design for space savings
- Dynamic power boost to start heavy loads
- Tool-free push-in connection for easy installation
- Relay contacts and voltage potentiometer
- Robust design for standard applications
- High vibration and shock resistance

## UNO POWER – Compact with basic functionality

- Compact form factor for space savings
- Cost-effective options
- Ideal for basic applications up to 480 W
- Wide range of products from 5 V DC to 48 V DC
- High energy efficiency to reduce power dissipation
- Wide temperature range for use in most environments

Conversion

# DC/DC converters

DC/DC converters alter the voltage level. They regenerate the voltage at the end of long cables or create electrically isolated independent supply systems.

DC/DC converters are the control cabinet problem solvers. They can convert voltage from one level to another. DC/DC converters can also amplify, regulate, and isolate voltage to eliminate noise and other unexpected complications within an application.

- DC/DC converters with selective fuse breaking technology
- DC/DC converters with conformal coating with additional hazardous location approvals
- DC/DC converters for low power applications
- DC/DC converters for solar applications




## QUINT POWER – DC/DC converters

- Uses galvanic isolation to increase reliability
- Permanent power boost of up to 125 percent
- Breaker tripping pulse to avoid oversizing
- Remote monitoring for critical applications
- Monitors the input voltage for battery applications

## QUINT POWER DC/DC converters with protective coating

- Conformally-coated PCB for extreme environments
- Resistant to corrosive gases, debris, and moisture
- Equivalent benefits of the QUINT DC/DC converters
- Meets ATEX, IECEx, and Class I Division 2 approvals
- Meets medical standard IEC 60601, 2 x MOOP

## Low power and specialized DC/DC converters

**Low-power DC/DC converters**

- Suitable for low power applications with current options up to 2 A
- Lower voltage conversion and isolation

**Specialized DC/DC converters**

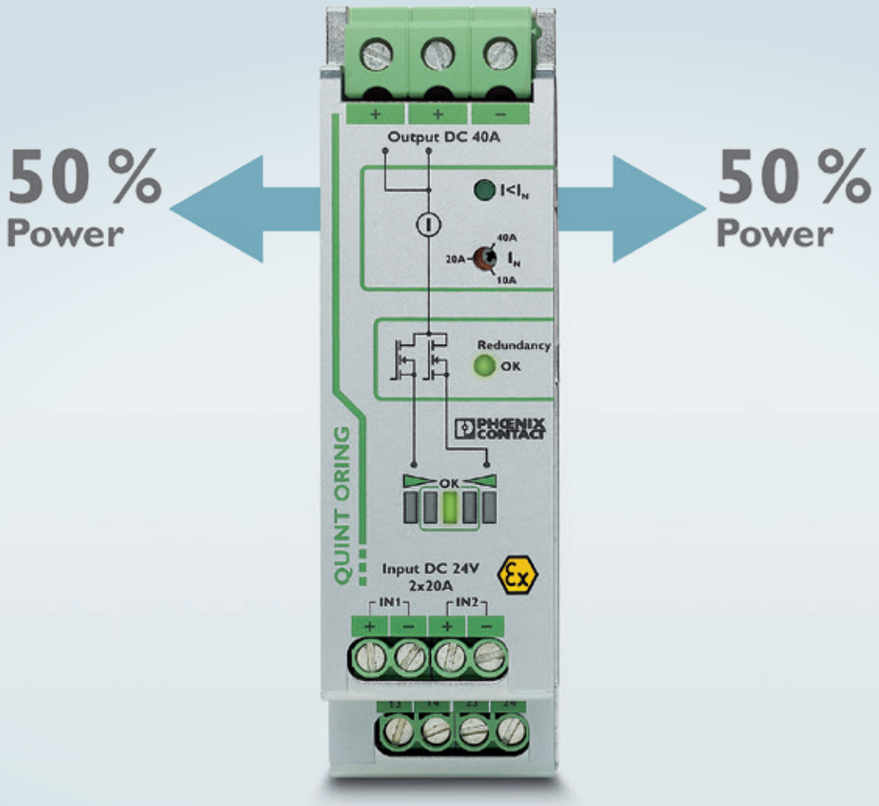
- Converts high voltage to a safe low voltage for specialized applications
- Wide input voltage ranging from 300 V DC … 1650 V DC
- UL 1751 and UL 62109 certified for simplified system approval

Conversion

# Redundancy modules

A dependable redundant system decouples a parallel connection of two power supplies with an active redundancy module. Decoupling the power supplies ensures that a fault on one power supply will not affect the other power supply. Phoenix Contact provides many options for a reliable redundant power system including:

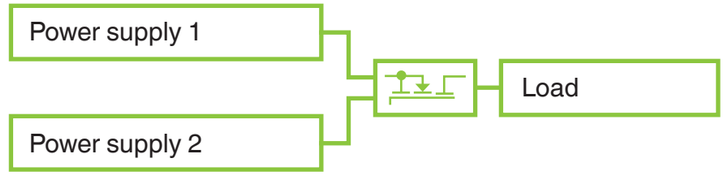
- QUINT ORING – decouples, monitors, and controls
- QUINT S-ORING – decouples and monitors
- Basic diode modules – decouples




ACB TECHNOLOGY

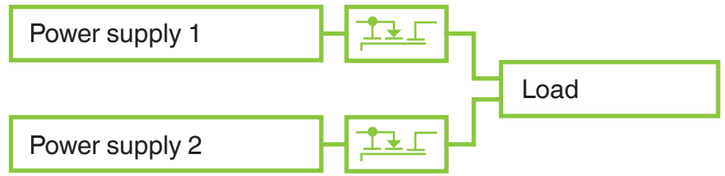
## QUINT ORING

- ☑ Active decoupling with MOSFETs ensuring low energy losses
- ☑ Monitors the voltage, wiring, and load current
- ☑ Uses Auto Current Balancing to maintain load sharing



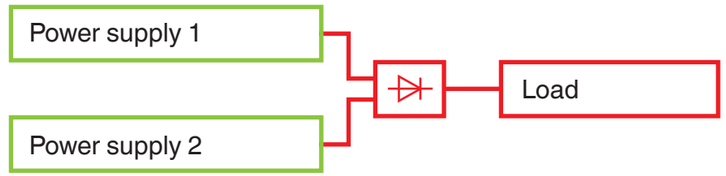

## QUINT S-ORING

- ☑ Single-channel redundancy to maintain a redundant system
- ☑ Active decoupling with MOSFETs ensuring low energy losses
- ☑ Facilitates a design for SIL3 requirements




## Diodes

- ☑ Simple decoupling with diodes
- ☑ QUINT, TRIO, and UNO options available for easy selection
- ☑ QUINT options are approved for hazardous locations




Monitored
Non-monitored

Conversion

# Uninterruptible power supplies

Mains interruptions can have serious consequences. Don’t take any risks. Rely on our uninterruptible power supplies. Phoenix Contact provides the DC and AC UPS solutions for optimum system availability, even in the event of a mains failure.

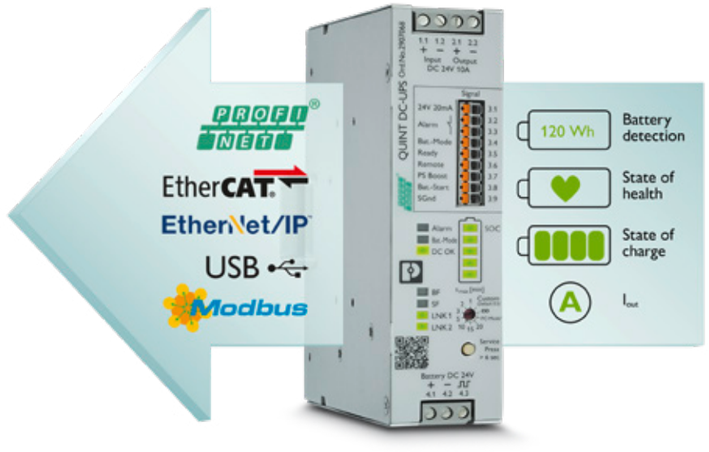
- DC battery backup options
- AC battery backup options


## QUINT UPS for DC applications

- ☑ IQ technology provides the state of health and charge of the battery
- ☑ Permanent power boost of up to 125 percent
- ☑ Remote battery start function
- ☑ Powerful battery charging circuit allows for fast battery charging
- ☑ Easy monitoring, configuring, and remote shutdown

**Integrated industrial Ethernet protocols**

- PROFINET
- EtherNet/IP™
- EtherCAT®
- Modbus TCP/IP




## QUINT UPS for AC applications

- ☑ Delivers a pure sine wave
- ☑ Offline and online options available
- ☑ Fan-free heat dissipation via convection cooling
- ☑ Multiple diagnostic outputs for system monitoring
- ☑ Remote battery start function
- ☑ USB interface for connection to industrial PCs and controllers

Conversion

# Energy storage

Energy storage devices provide quality and reliability. With a variety of energy storage options for our modular system of uninterruptible power supplies, you will always have the ideal solution for your system. When connected with our intelligent UPS, energy storage devices are automatically detected, allowing for fast and easy installation. The energy storage system communicates with the UPS allowing for continuous monitoring and predictive maintenance. Our various energy storage alternatives offer a wide range of different features and benefits.

- VRLA batteries for maximum buffer times
- VRLA-WTR batteries for use in extreme temperatures
- LI-ION batteries for a long service life
- CAP modules for maximum service life and minimal maintenance



## VRLA batteries

- ☑ Cost-effective valve regulated lead acid (VRLA) storage modules
- ☑ Tool-free battery replacement
- ☑ Batteries can be hot-swappable
- ☑ Options ranging from 1.3 Ah to 38 Ah

## VRLA-WTR

- ☑ Valve regulated lead acid storage modules with a wide temperature range
- ☑ Operating temperature ranging from -25°C … 60°C
- ☑ Industrial mounting bracket available
- ☑ Options ranging from 13 Ah to 26 Ah

## LI-ION

- ☑ Lithium iron phosphate technology
- ☑ Operating temperature ranging from -20 °C … 58 °C
- ☑ Provides a long service life with long buffer times
- ☑ Options ranging from 120 Wh to 924 Wh

## CAP modules

- ☑ Maintenance-free electrolytic capacitors
- ☑ Operating temperature ranging from -40 °C … 60 °C
- ☑ High MTBF and short recharging times
- ☑ QUINT CAP modules are ideal for buffering sensitive devices during a short duration power loss

# Common products for conversion

**AC/DC power supplies**

| | |
|---|---|
| **A. Do you need a single-phase or a three-phase power supply?** | **D. Does the power supply need Class I, Division 2 rating?** |
| **B. What is the output DC voltage?** | **E. Type description** |
| **C. What is your output current? (amps)** | **F. Resulting Phoenix Contact part number** |

| A. Phase | B. Output voltage | C. Output current | D. Class I, Div. 2 | E. Type description | F. Order # |
|---|---|---|---|---|---|
| Single phase | 5 V DC | 5A | Yes | UNO-PS/1AC/5DC/25W | 2904374 |
| | | 8A | Yes | UNO-PS/1AC/5DC/40W | 2904375 |
| | 12 V DC | 2.5A | Yes | UNO-PS/1AC/12DC/30W | 2902998 |
| | | 4.6A | Yes | UNO-PS/1AC/12DC/55W | 2902999 |
| | | 8.3A | Yes | UNO-PS/1AC/12DC/100W | 2902997 |
| | | 10A | Yes | TRIO-PS-2G/1AC/12DC/10 | 2903158 |
| | | 20A | Yes | QUINT-PS/1AC/12DC/20 | 2866721 |
| | 24 V DC | 1.25A | Yes | UNO-PS/1AC/24DC/30W | 2902991 |
| | | 1.3A | Yes | QUINT4-PS/1AC/24DC/1.3/PT | 2909575 |
| | | 1.3A | Yes | QUINT4-PS/1AC/24DC/1.3/SC | 2904597 |
| | | 2.5A | Yes | UNO-PS/1AC/24DC/60W | 2902992 |
| | | 2.5A | Yes | QUINT4-PS/1AC/24DC/2.5/PT | 2909576 |
| | | 2.5A | Yes | QUINT4-PS/1AC/24DC/2.5/SC | 2904598 |
| | | 3.75A | Yes | UNO-PS/1AC/24DC/90W/C2LPS | 2902994 |
| | | 3.8A | Yes | QUINT4-PS/1AC/24DC/3.8/PT | 2909577 |
| | | 3.8A | Yes | QUINT4-PS/1AC/24DC/3.8/SC | 2904599 |
| | | 4.2A | Yes | UNO-PS/1AC/24DC/100W | 2902993 |
| | | 5A | Yes | QUINT4-PS/1AC/24DC/5 | 2904600 |
| | | 5A | Yes | TRIO-PS-2G/1AC/24DC/5 | 2903148 |
| | | 10A | Yes | QUINT4-PS/1AC/24DC/10 | 2904601 |
| | | 10A | Yes | TRIO-PS-2G/1AC/24DC/10 | 2903149 |
| | | 20A | Yes | UNO2-PS/1AC/24DC/480W | 2910105 |
| | | 20A | Yes | QUINT4-PS/1AC/24DC/20 | 2904602 |
| | | 20A | Yes | QUINT4-PS/1AC/24DC/20/+ | 2904617 |
| | | 40A | Yes | QUINT4-PS/1AC/24DC/40 | 2904603 |
| | 48 V DC | 1.25A | Yes | UNO-PS/1AC/48DC/60W | 2902995 |
| | | 5A | Yes | QUINT-PS/1AC/48DC/5 | 2866679 |
| | | 5A | Yes | TRIO-PS-2G/1AC/48DC/5 | 2903159 |
| | | 10A | Yes | QUINT4-PS/1AC/48DC/10 | 2904611 |
| | | 10A | Yes | TRIO-PS-2G/1AC/48DC/10 | 2903160 |
| | | 20A | Yes | QUINT-PS/1AC/48DC/20 | 2866695 |
| Three phase | 24 V DC | 5A | Yes | QUINT4-PS/3AC/24DC/5 | 2904620 |
| | | 5A | Yes | TRIO-PS-2G/3AC/24DC/5 | 2903153 |
| | | 10A | Yes | QUINT4-PS/3AC/24DC/10 | 2904621 |
| | | 10A | Yes | TRIO-PS-2G/3AC/24DC/10 | 2903154 |
| | | 20A | Yes | QUINT4-PS/3AC/24DC/20 | 2904622 |
| | | 40A | Yes | QUINT4-PS/3AC/24DC/40 | 2904623 |
| | 48 V DC | 20A | Yes | QUINT-PS/3AC/48DC/20 | 2320827 |

**DC/DC converters**

| | |
|---|---|
| **A. What is the input DC voltage?** | **D. Does the power supply need Class I, Division 2 rating?** |
| **B. What is the output?** | **E. Type description** |
| **C. What is your output current? (amps)** | **F. Resulting Phoenix Contact part number** |

| A. Input voltage | B. Output voltage | C. Output current | D. Class I, Div. 2 | E. Type description | F. Order # |
|---|---|---|---|---|---|
| 12 V DC | 12 V DC | 8A | Yes | QUINT-PS/12DC/12DC/8 | 2905007 |
| 12 V DC | 24 V DC | 5A | Yes | QUINT-PS/12DC/24DC/5 | 2320131 |
| 24 V DC | 12 V DC | 8A | Yes | QUINT4-PS/24DC/12DC/8/PT | 2910122 |
| 24 V DC | 24 V DC | 5A | Yes | QUINT4-PS/24DC/24DC/5/PT | 2910119 |
| | | 5A | Yes | QUINT4-PS/24DC/24DC/5/SC | 1046800 |
| | | 10A | Yes | QUINT4-PS/24DC/24DC/10/PT | 2910120 |
| | | 10A | Yes | QUINT4-PS/24DC/24DC/10/SC | 1046803 |
| | | 20A | Yes | QUINT4-PS/24DC/24DC/20/PT | 2910121 |
| | | 20A | Yes | QUINT4-PS/24DC/24DC/20/SC | 1046805 |
| 24 V DC | 48 V DC | 5A | Yes | QUINT4-PS/24DC/48DC/5/PT | 2910123 |
| 48 V DC | 24 V DC | 5A | Yes | QUINT4-PS/48DC/24DC/5/PT | 2910125 |
| 48 V DC | 48 V DC | 5A | Yes | QUINT4-PS/48DC/48DC/5/PT | 2910128 |
| 60 … 72 V DC | 24 V DC | 10A | Yes | QUINT-PS/60-72DC/24DC/10 | 2905009 |

**Redundancy modules**

| | |
|---|---|
| **A. What is the input DC voltage?** | **D. Does the power supply need Class I, Division 2 rating?** |
| **B. What is the output DC voltage?** | **E. Type description** |
| **C. What is your output current? (amps)** | **F. Resulting Phoenix Contact part number** |

| A. Input voltage | B. Output voltage | C. Output current | D. Class I, Div. 2 | E. Type description | F. Order # |
|---|---|---|---|---|---|
| 12…24 V DC | 12…24 V DC | 2 x 20 A/1 x 40 A | Yes | QUINT4-DIODE/12-24DC/2x20/1x40 | 2907719 |
| 48 V DC | 48 V DC | | | QUINT4-DIODE/48DC/2x20/1x40 | 2907720 |
| 12…24 V DC | 12…24 V DC | 1 x 40 A | Yes | QUINT4-S-ORING/12-24DC/1X40 | 2907752 |
| | | | | QUINT4-S-ORING/12-24DC/1X40/+ | 2907753 |
| 24 V DC | 24 V DC | 2 x 10 A/1 x 20 A | Yes | QUINT-ORING/24DC/2x10/1x20 | 2320173 |
| | | 2 x 20 A/1 x 40 A | Yes | QUINT-ORING/24DC/2x20/1x40 | 2320186 |
| | | 2 x 40 A/1 x 80 A | Yes | QUINT-ORING/24DC/2X40/1X80 | 2902879 |

**DC UPS**

| | |
|---|---|
| **A. What is the input DC voltage?** | **D. Does the power supply need Class I, Division 2 rating?** |
| **B. What is the output DC voltage and output current?** | **E. Type description** |
| **C. What industrial network are you working with?** | **F. Resulting Phoenix Contact part number** |

| A. Input voltage | B. Output voltage and current | C. Industrial network | D. Class I, Div. 2 | E. Type description | F. Order # |
|---|---|---|---|---|---|
| 24 V DC | 24V DC/5 A | PROFINET | Yes | QUINT4-UPS/24DC/24DC/5/PN | 2906993 |
| | 24V DC/10 A | PROFINET | Yes | QUINT4-UPS/ 24DC/ 24DC/10/PN | 2907068 |
| | 24V DC/20 A | PROFINET | Yes | QUINT4-UPS/ 24DC/ 24DC/20/PN | 2907073 |
| | 24V DC/5 A | EtherNet/IP - ModbusTCP/IP | Yes | QUINT4-UPS/ 24DC/ 24DC/5/EIP | 2906994 |
| | 24V DC/10 A | EtherNet/IP - ModbusTCP/IP | Yes | QUINT4-UPS/ 24DC/ 24DC/10/EIP | 2907069 |
| | 24V DC/20 A | EtherNet/IP - ModbusTCP/IP | Yes | QUINT4-UPS/ 24DC/ 24DC/20/EIP | 2907074 |
| | 24V DC/5 A | EtherCAT | Yes | QUINT4-UPS/ 24DC/ 24DC/5/EC | 2906996 |
| | 24V DC/10 A | EtherCAT | Yes | QUINT4-UPS/ 24DC/ 24DC/10/EC | 2907070 |
| | 24V DC/20 A | EtherCAT | Yes | QUINT4-UPS/ 24DC/ 24DC/20/EC | 2907076 |
| | 24V DC/5 A | USB | Yes | QUINT4-UPS/ 24DC/ 24DC/5/USB | 2906991 |
| | 24V DC/10 A | USB | Yes | QUINT4-UPS/ 24DC/ 24DC/10/USB | 2907067 |
| | 24V DC/20 A | USB | Yes | QUINT4-UPS/ 24DC/ 24DC/20/USB | 2907072 |
| | 24V DC/5 A | No interface | Yes | QUINT4-UPS/ 24DC/ 24DC/5 | 2906990 |
| | 24V DC/10 A | No interface | Yes | QUINT4-UPS/ 24DC/ 24DC/10 | 2907066 |
| | 24V DC/20 A | No interface | Yes | QUINT4-UPS/ 24DC/ 24DC/20 | 2907071 |

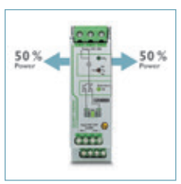
**Batteries**

| | |
|---|---|
| **A. What is the input DC voltage?** | **E. Does the power supply need Class I, Division 2 rating?** |
| **B. How many watt hours or amp hours does your application need?** | **F. Type description** |
| **C. What energy storage type are you looking for?** | **G. Resulting Phoenix Contact part number** |
| **D. What industrial network can the battery work with?** | |

| A. Input voltage | B. Wh, Ah, or A/Kj | C. Energy storage type | D. Industrial network compatibility | E. Class I, Div. 2 | F. Type description | G. Order # |
|---|---|---|---|---|---|---|
| 24 V DC | 1.3 Ah | VRLA | All | Yes | UPS-BAT/VRLA/24DC/1.3AH | 2320296 |
| | 7.2 Ah | VRLA | All | Yes | UPS-BAT/VRLA/24DC/7.2AH | 2320319 |
| | 12 Ah | VRLA | All | Yes | UPS-BAT/VRLA/24DC/12AH | 2320322 |
| | 13 Ah | VRLA-WTR | All | Yes | UPS-BAT/VRLA-WTR/24DC/13AH | 2320416 |
| | 26 Ah | VRLA-WTR | All | Yes | UPS-BAT/VRLA-WTR/24DC/26AH | 2320429 |
| | 120 Wh | LI-ION | All | Yes | UPS-BAT/LI-ION/24DC/120WH | 2320351 |
| | 924 Wh | LI-ION | All | Yes | UPS-BAT/LI-ION/24DC/924WH | 2908232 |
| | 10 A/10 kJ | CAP | No interfaced UPS | Yes | UPS-CAP/24DC/10A/10KJ | 2320377 |
| | 20 A/20 kJ | CAP | No interfaced UPS | Yes | UPS-CAP/24DC/20A/20KJ | 2320380 |

AC/DC power supplies

DC/DC converters




Redundancy modules

UPS and battery backup

# Monitoring

## System reliability. User accountability. Process efficiency.

Just-in-time maintenance starts with machine health data. Energy efficiency improvement relies on identifying waste. However, it is impossible to know what is happening or what can be improved within a machine if it is not being monitored. Basic monitoring provides a greater edge in maintaining an efficient, reliable system with minimal downtime.

Goodbye reactive maintenance, hello just-in-time services! Phoenix Contact's energy monitoring products provide insights into your equipment's state of health and power consumption trends, empowering you to make informed maintenance and operational decisions.

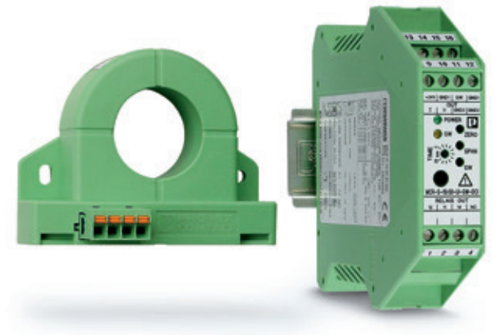


## Voltage transducers

Voltage is a good indicator of overall power system health. Voltage touches every component in a system – applying the incorrect voltage can result in severe equipment damage, improperly charged batteries, or even burned up electrical motors.  Easily convert up to 660 V AC to standard analog signals.

## Current transducers

Current can be used to readily detect the state of health of processes or individual pieces of equipment. Each end-device is designed to consume a nominal amount of current. Device failure can be detected preeminently by observing changes in current draw over time.



## Energy meters

Within industrial systems, power consumption gives granular details that can be missed by monitoring voltage or current alone. Monitoring power has several benefits in addition to helping to predict failures; power thresholds can detect clogged filters, overloaded motors, and more.


## Monitoring relays

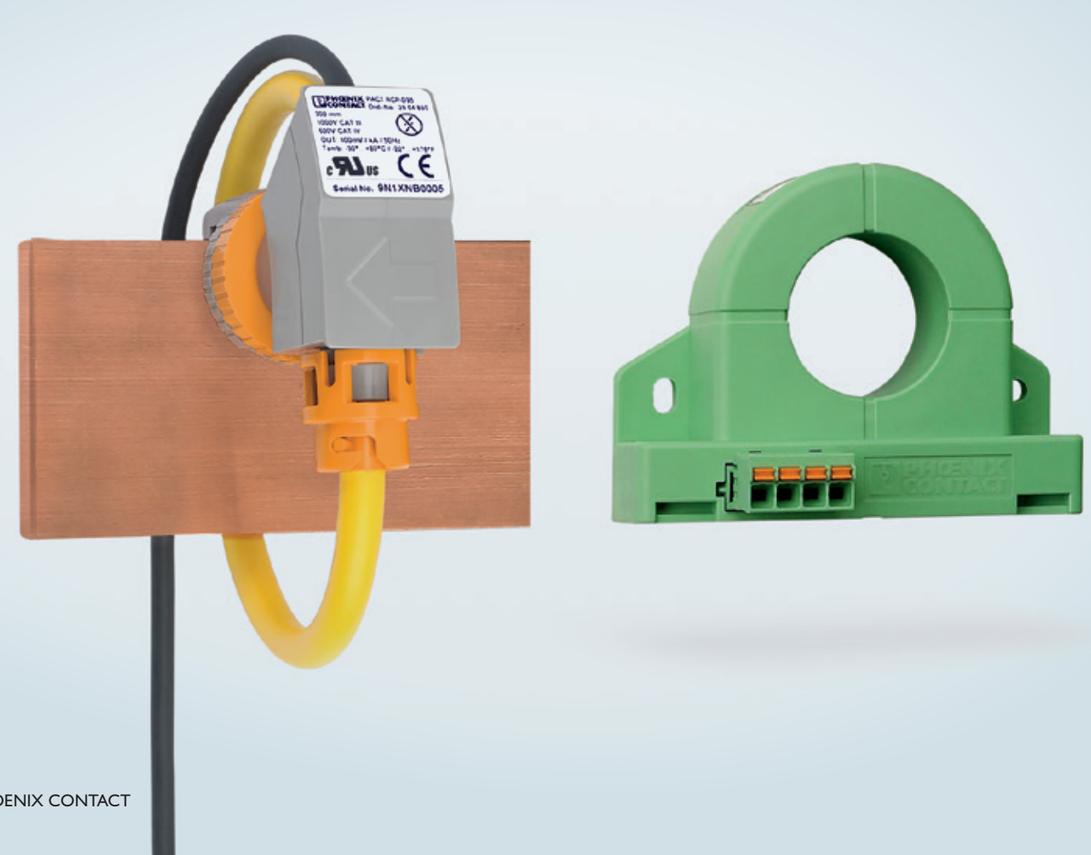
Monitoring relays offer a unique packaged solution to protect against undesirable conditions. Sometimes, a simple threshold switch is all that is needed to protect against or detect an undesirable condition. Spot heater and lighting failures, prevent brown-out voltage damage, and ensure proper three-phase motor rotation, all with self-contained monitoring relays.

Monitoring

# Voltage and current transducers

Transducers tackle the difficult task of measuring high currents and voltages, allowing you to incorporate these measurements into a control system using standard analog signals. By building up a network of voltage and current sensors, system and machine health can be continuously monitored for fault conditions.

- Voltage transducers – analog measurement of AC and DC voltages
- Current transducers – analog measurement of AC, DC, and distorted currents
- Fixed and programmable range modules – solutions for both precise and universal applications



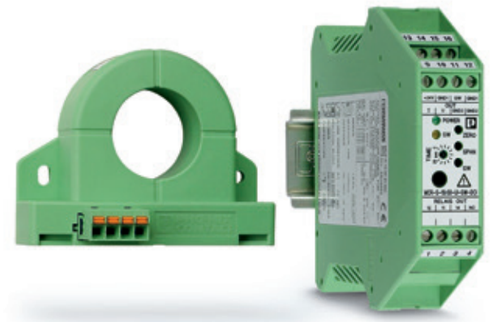


## AC/DC voltage transducers

- ☑ AC and DC solutions
- ☑ Bidirectional output signals for DC applications
- ☑ Multiple input ranges for higher precision
- ☑ ZERO/SPAN adjustment +/-20 percent
- ☑ Up to 660 V measuring capability

## AC/DC current transducers

- ☑ Customizable input/output ranges
- ☑ Available alarm contacts
- ☑ Can be ordered pre-configured
- ☑ Compact devices up to 55 A
- ☑ DIN rail- or direct-mount devices up to 600 A

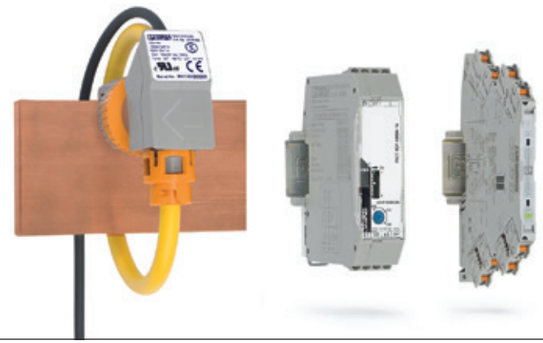


## AC current transducers

- ☑ Measure sinusoidal and distorted currents
- ☑ Easily retrofit existing conductors
- ☑ Convert 0-1 A/0-5 A AC current transformers to analog outputs
- ☑ Compact devices up to 16 A
- ☑ DIN rail- or direct-mount devices up to 400 A

## Retrofit solutions for AC current

- ☑ Touch-safe Rogowski principle of operation
- ☑ Flexible and compact coil allows for easy retrofitting
- ☑ Direct connection to EMpro meters
- ☑ Optional 0-1A AC or analog output transducers
- ☑ Tool-free installation with unique bus bar clamp
- ☑ One part covers ranges from 0-100 A to 0-10,000 A AC



Monitoring

# Energy meters and monitoring relays

Energy meters combine the measurement of current and voltage to offer more complex insights into system operations. Monitoring relays offer prepackaged solutions to protect against undesirable conditions within systems.

- Energy meters – measure, communicate, and display AC energy data
- Electronic motor managers – turns energy data into actionable, just-in-time maintenance events
- Voltage and current monitoring relays – monitor DC, single phase, and three phase systems
- Additional monitoring relays – detection of tank levels, power factor, and energy usage thresholds


## Energy meters

- ☑ Simple user experience with 3-step installation wizard
- ☑ Powerful webserver with data logging and visualization
- ☑ Intregrated MODBUS TCP/IP and REST API on every meter
- ☑ Optional Ethernet/IP, PROFINET and MODBUS RTU communications
- ☑ Panel-mount and DIN rail-mount options
- ☑ Measure AC parameters such as voltage, current, power, energy, harmonics, and more


Modbus

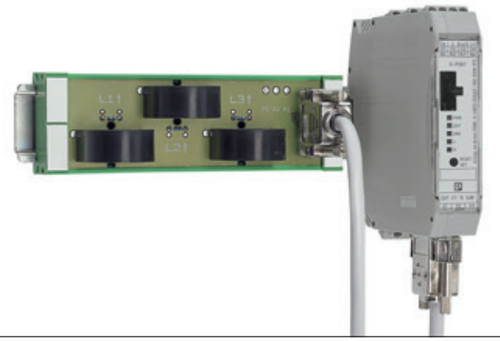
PROFINET

EtherNet/IP

{ REST API }

## Electronic motor managers

- ☑ Turn motors into sensors – avoid additional costs
- ☑ Power consumption can predict maintenance needs
- ☑ Instantly detect overloads, underloads, and failures
- ☑ Freely-configurable warning and alarm thresholds
- ☑ Schedule maintenance events only when needed



## Compact monitoring relays

- ☑ Compact housings with available PT connection
- ☑ Implementation of essential functions
- ☑ Monitor voltage, current, and phases
- ☑ Line-powered modules
- ☑ Cost-effective solutions for serial production

## Multi-function monitoring relays

- ☑ Wide-range power supplies for global applications
- ☑ Multi-function modules reduce inventory needs
- ☑ Customizable thresholds and delay times
- ☑ Protect a variety of systems
- ☑ Monitor voltage, current, phases, temperature, level, power, and power-factor

# Common products for monitoring

**Transducers**

**A. What is being measured?**
**B. Is it AC or DC?**
**C. What is the measuring range?**
**D. What is the desired output?**
**E. Resulting Phoenix Contact part number**

| A. Voltage | B. AC or DC | C. Measuring range | D. Output | Type-description | E. Order # |
|---|---|---|---|---|---|
| | AC | 0 … 24/36/54/80/120/170/250/370/550 V AC | 0-10 V/4-20 mA | MACX MCR-VAC | 2906239 |
| | DC | ± 0 … 24/36/54/80/120/170/250/370/550 V DC | 0-10V/4-20 mA (unipolar mode) | MACX MCR-VDC | 2906242 |
| | DC | 0 … 1500 V DC | 2-10 V | SCK-M-U-1500V | 2903591 |
| **A. Current** | AC/DC | 0 … 1/5/10 A AC/DC | 0-10 V/4-20 mA | MCR-S-1-5-UI-DCI-NC | 2814715 |
| | | 0 … 12.5/20/55 A AC/DC | 0-10 V/4-20 mA | MCR-S10-50-UI-DCI-NC | 2814728 |
| | | 0 … 100 A AC/DC | 0-10 V | MCR-SL-CUC-100-U | 2308108 |
| | | 0 … 100 A AC/DC | 4-20 mA | MCR-SL-CUC-100-I | 2308027 |
| | | 0 … 200 A AC/DC | 0-10 V | MCR-SL-CUC-200-U | 2308205 |
| | | 0 … 200 A AC/DC | 4-20 mA | MCR-SL-CUC-200-I | 2308030 |
| | | 0 … 300 A AC/DC | 0-10 V | MCR-SL-CUC-300-U | 2308302 |
| | | 0 … 300 A AC/DC | 4-20 mA | MCR-SL-CUC-300-I | 2308043 |
| | | 0 … 400 A AC/DC | 4-20 mA | MCR-SL-CUC-400-I | 2308072 |
| | | 0 … 500 A AC/DC | 4-20 mA | MCR-SL-CUC-500-I | 2308085 |
| | | 0 … 600 A AC/DC | 4-20 mA | MCR-SL-CUC-600-I | 2308098 |
| | AC | 0 … 1/5 AC | 4-20 mA | MACX MCR-SL-CAC 5-I | 2810612 |
| | | 0 … 5/12 A AC | 4-20 mA | MACX MCR-SL-CAC 12-I-UP | 2810638 |
| | | 0 … 50/75/100 A AC | 0-10 V | MCR-SL-S-100-U | 2813457 |
| | | 0 … 50/75/100 A AC | 4-20 mA | MCR-SL-S-100-I-LP | 2813486 |
| | | 0 … 100/150/200 A AC | 0-10 V | MCR-SL-S-200-U | 2813460 |
| | | 0 … 100/150/200 A AC | 4-20 mA | MCR-SL-S-200-I-LP | 2813499 |

**Monitoring relays**

**A. What is being monitored?**
**B. Is it AC or DC?**
**C. What is the desired function?**
**D. What is the measuring range?**
**E. Resulting Phoenix Contact part number**

| A. Application | B. AC or DC | C. Function | D. Measuring range | Type-description | E. Order # |
|---|---|---|---|---|---|
| Voltage | AC/DC | Undervoltage, window | 0 … 24 V AC/DC, 0 … 230 V AC | EMD-BL-V-230 | 2903523 |
| | | Undervoltage | 0 … 30/60/300 V AC/DC | EMD-SL-V-UV-300 | 2866035 |
| | | Undervoltage, overvoltage, window | 0 … 30/60/300 V AC/DC | EMD-FL-V-300 | 2866048 |
| 3 Φ voltage | AC | Window, phase sequence | 280 … 519 V AC | EMD-BL-3V-400 | 2903525 |
| | | Undervoltage, phase monitoring | 161 … 299 V AC | EMD-FL-3V-230 | 2885773 |
| | | Undervoltage, phase monitoring | 280 … 520 V AC | EMD-FL-3V-400 | 2866064 |
| | | Phase sequence, phase failure, asymmetry | 187 … 519 V AC | EMD-BL-PH-480 | 2903527 |
| | | Undervoltage, phase sequence, phase failure | 177 … 794 V AC | EMD-SL-PH-690 | 2905597 |
| Current | AC/DC | Undercurrent | 0 … 100 mA/ 0 … 1 A/0 … 10A | EMD-SL-C-UC-10 | 2867937 |
| | | Overcurrent | 0 … 100 mA/ 0 … 1 A/0 … 10A | EMD-SL-C-OC-10 | 2866019 |
| | | Overcurrent, undercurrent, window | 0 … 100 mA/ 0 … 1 A/0 … 10A | EMD-FL-C-10 | 2866022 |
| 3 Φ power | AC | Underload, overload, window | 0 … 12 A/0 … 480 V AC | EMD-FL-RP-480 | 2900177 |
| 3 Φ power factor | AC | Underload, overload, window | 0 … 10 A/40 … 415 V AC | EMD-FL-PF-400 | 2885809 |
| Motor temperature | - | Winding temperature threshold | Up to 6 PTCs | EMD-SL-PTC | 2866093 |


Voltage transducers


Current transducers


Energy meters


Rogowski coils



**Rogowski coil kits**

**A. Range**
**B. What is the desired output?**
**C. What is the desired coil diameter?**
**D. What is the desired signal lead length**
**E. Resulting Phoenix Contact part number**

| A. Range | B. Output | C. Coil diameter | D. Signal lead length | Type-description | E. Order # |
|---|---|---|---|---|---|
| DIP-selectable:<br>0 … 100 A AC<br>0 … 250 A AC<br>0 … 400 A AC<br>0 … 630 A AC<br>0 … 1000 A AC<br>0 … 1500 A AC<br>0 … 2000 A AC<br>0 … 4000 A AC | 0 … 10 V/4 … 20 mA | 3.75" | 3 meters | PACT RCP-4000A-UIRO-D95 | 2906231 |
| | | 5.5" | | PACT RCP-4000A-UIRO-D140 | 2906232 |
| | | 7" | | PACT RCP-4000A-UIRO-D190 | 2906233 |
| | 0 … 1 A AC (True CT output) | 3.75" | 3 meters | PACT RCP-4000A-1A-D95 | 2904921 |
| | | 5.5" | | PACT RCP-4000A-1A-D140 | 2904922 |
| | | 7" | | PACT RCP-4000A-1A-D190 | 2904923 |
| | 0 … 1 A AC (True CT output) | 3.75" | 5 meters | PACT RCP-4000A-1A-D95-5M | 2910325 |
| | | 3.75" | 10 meters | PACT RCP-4000A-1A-D95-10M | 2910326 |
| | | 5.5" | | PACT-RCP-4000A-1A-D140-10M | 1033483 |
| | | 7" | | PACT RCP-4000A-1A-D190-10M | 2910327 |

**Single Rogowski coils**

**A. Range**
**B. What is the desired coil diameter?**
**C. What is the desired signal lead length?**
**D. Resulting Phoenix Contact part number**

| A. Range | B. Coil diameter | C. Signal lead length | Type-description | D. Order # |
|---|---|---|---|---|
| 0 … 10,000 A AC | 3.75" | 3 meters | PACT RCP-D95 | 2904890 |
| | 5.5" | | PACT RCP-D140 | 2904891 |
| | 7" | | PACT RCP-D190 | 2904892 |
| | 3.75" | 5 meters | PACT RCP-D95-5M | 2910322 |
| | 3.75" | 10 meters | PACT RCP-D95-10M | 2910323 |
| | 5.5" | | PACT-RCP-D140-10M | 1033482 |
| | 7" | | PACT RCP-D190-10M | 2910324 |

**Energy meters**

**A. What is the current measurement input type?**
**B. Will the meter be panel-mounted, DIN rail-mounted with display, or DIN rail-mounted without display?**
**C. What is the desired communications interface?**
**D. What is the meter power supply voltage?**
**E. Resulting Phoenix Contact part number**

| A. Current input | B. Mounting/ style | C. Power supply voltage | D. Communications | Type-description | E. Part number |
|---|---|---|---|---|---|
| Current transformer | Panel mount | 80 … 480 V AC / 120V … 300 V DC | Modbus TCP + REST API | EEM-MA770 | 2907945 |
| | | | Modbus RTU + Modbus TCP + REST API | EEM-MA770-R | 2907944 |
| | | | EtherNet/IP + Modbus TCP + REST API | EEM-MA770-EIP | 2907953 |
| | | | PROFINET + Modbus TCP + REST API | EEM-MA770-PN | 2907946 |
| | | 18 … 30 V DC | Modbus TCP + REST API | EEM-MA770-24DC | 1127052 |
| | DIN mount w/display | 80 … 480 V AC / 120V … 300 V DC | Modbus TCP + REST API | EEM-MA370 | 2907983 |
| | | | Modbus RTU + Modbus TCP + REST API | EEM-MA370-R | 2907980 |
| | | 18 … 30 V DC | Modbus TCP + REST API | EEM-MA370-24DC | 1127059 |
| | DIN mount w/o display | 80 … 480 V AC / 120V … 300 V DC | Modbus TCP + REST API | EEM-MB370 | 2907954 |
| | | | EtherNet/IP + Modbus TCP + REST API | EEM-MB370-EIP | 2907971 |
| | | | PROFINET + Modbus TCP + REST API | EEM-MB370-PN | 2907984 |
| | | 18 … 30 V DC | Modbus TCP + REST API | EEM-MB370-24DC | 1127061 |
| Direct Rogowski connection | Panel mount | 80 … 480 V AC / 120V … 300 V DC | Modbus TCP + REST API | EEM-MA771 | 2908286 |
| | | | Modbus RTU + Modbus TCP + REST API | EEM-MA771-R | 2908285 |
| | | | EtherNet/IP + Modbus TCP + REST API | EEM-MA771-EIP | 2908302 |
| | | | PROFINET + Modbus TCP + REST API | EEM-MA771-PN | 2908301 |
| | | 18 … 30 V DC | Modbus TCP + REST API | EEM-MA771-24DC | 1127060 |
| | DIN mount w/ display | 80 … 480 V AC / 120V … 300 V DC | Modbus TCP + REST API | EEM-MA371 | 2908307 |
| | | | Modbus RTU + Modbus TCP + REST API | EEM-MA371-R | 2907985 |
| | | 18 … 30 V DC | Modbus TCP + REST API | EEM-MA371-24DC | 1127058 |
| | DIN mount w/o display | 80 … 480 V AC / 120V … 300 V DC | Modbus TCP + REST API | EEM-MB371 | 2907955 |
| | | | EtherNet/IP + Modbus TCP + REST API | EEM-MB371-EIP | 2907976 |
| | | | PROFINET + Modbus TCP + REST API | EEM-MB371-PN | 2908308 |
| | | 18 … 30 V DC | Modbus TCP + REST API | EEM-MB371-24DC | 1127055 |

# Distribution

## Fundamental reliability starts with quality connections

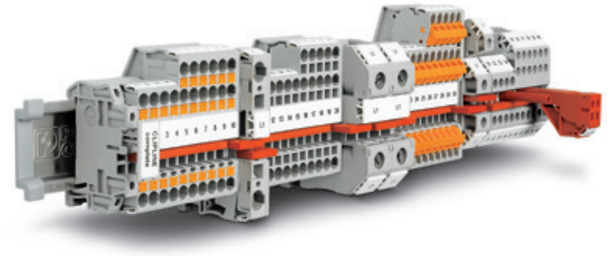
It is often said that one should never overlook the basics. When it comes to electrical connections, it couldn't be more true. Every wire in a control system has a purpose – every connection counts. Phoenix Contact is proud to offer a wide variety of high-quality power distribution solutions, all built around the industry's most robust connection technologies.


Founded in 1923, Phoenix Contact developed the first terminal block in 1928, which became fully patented in 1935. This was definitively the world's first modular, rail-mounted terminal block. Since that time, our expertise and innovation have continued to grow into the industry's broadest range of connectivity solutions offered today.



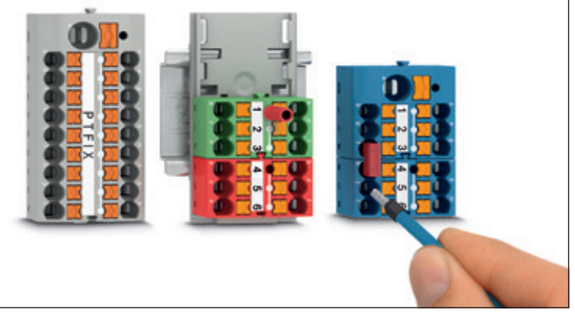
## Terminal blocks

Streamline inventory and simplify assembly with the CLIPLINE Complete modular terminal block system. No matter which of the five connection technologies is utilized, accessories are universal and can be used on any and every terminal block that is a member of the CLIPLINE Complete family.



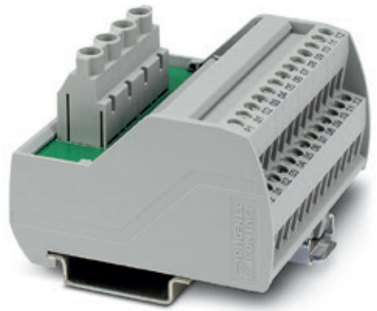
## Modular power distribution

Power distribution with no bridging required. Prepackaged power distribution blocks with modular designs allow for a wide range of customization. PTFIX distribution blocks are offered in multiple sizes and configurations for DIN rail- and direct-mounting.




## Power distribution modules

Single part number solutions for fast and easy distribution of two potentials. Save time, DIN rail space, and inventory hassle with VIP power distribution modules. Offered in 8-, 12-, 16-, and 24-circuit varieties.



## DIN rail outlets

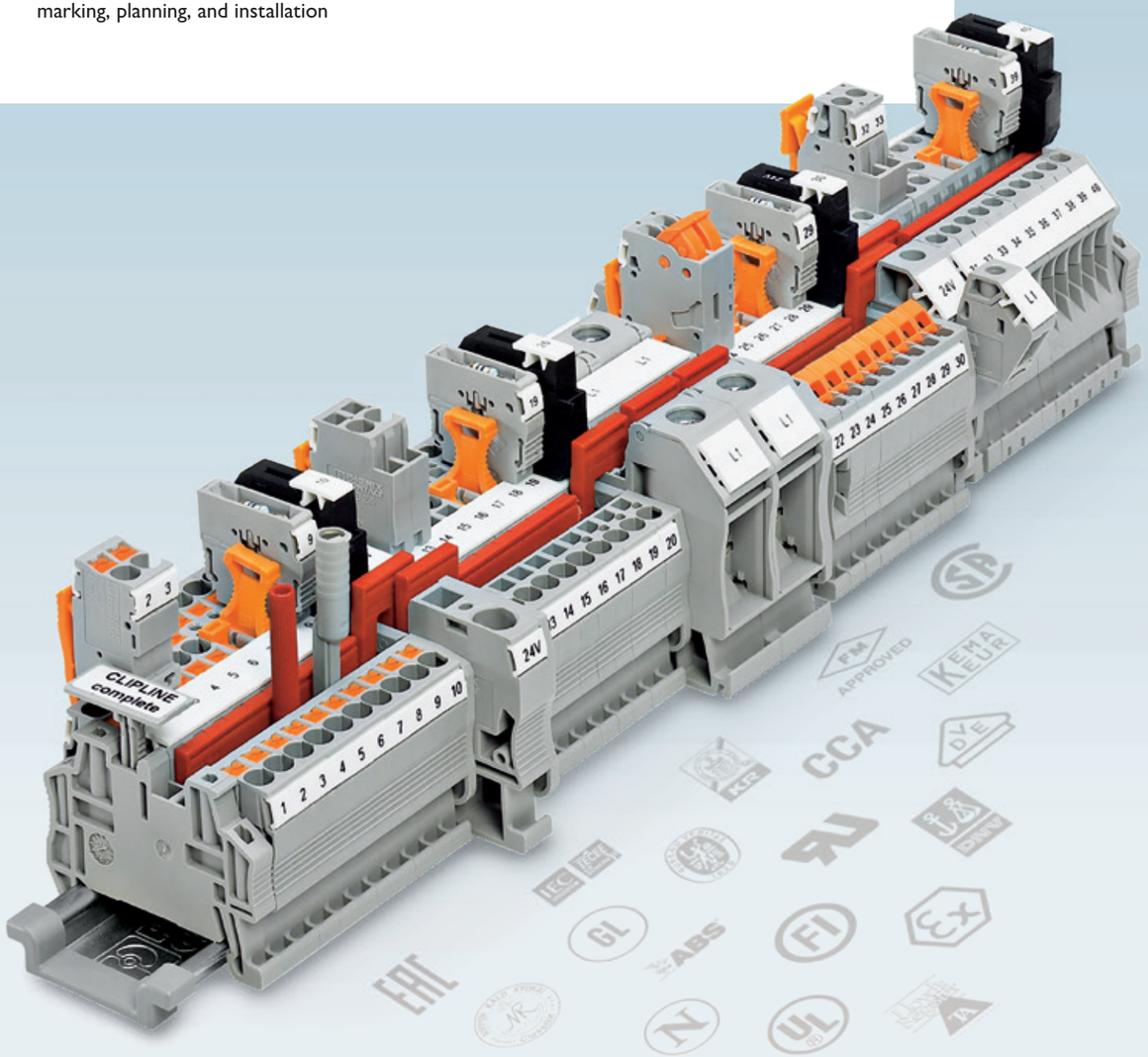
Convenience outlets provide power where it's needed. Whether it's powering a laptop, cellular devices, or tools, machine service is simplified and safer when an outlet is furnished. The product range offers GFI duplex, vertical or horizontal DIN rail mountable, or single and duplex direct or DIN rail mount, specified marking areas, and screw or push-in connection technology.

Distribution

# Terminal block solutions

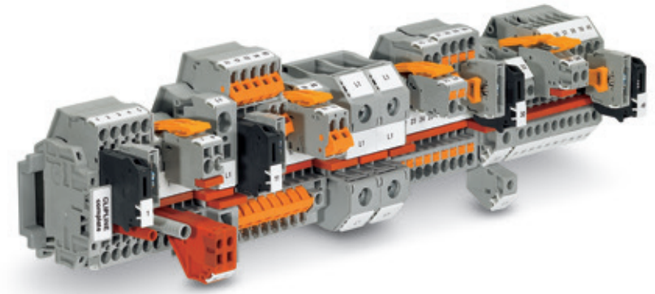
For nearly 100 years, Phoenix Contact has been a leading global innovator and manufacturer of terminal block solutions. We are proud to offer a complete terminal block portfolio with virtually endless opportunities for customization. Thanks to 5 available connection technologies, universal accessories, and a wide variety of sizes and terminal arrangements, the right terminal block is always available.

- Modular terminal blocks – inventor and market leader of terminal block solutions
- Push-in terminal (PT) – innovative technology now available in over 10,000 parts
- High productivity – full line of marking solutions and simplified accessories for streamlined marking, planning, and installation




## CLIPLINE Complete

- ☑ Universal accessories
- ☑ Modular design
- ☑ Wide variety of configurations and colors
- ☑ 5 available connection technologies:
  - Screw (UT)
  - Push-in (PT)
  - Spring (ST)
  - Bolt (RT)
  - Insulation displacement (QTC)

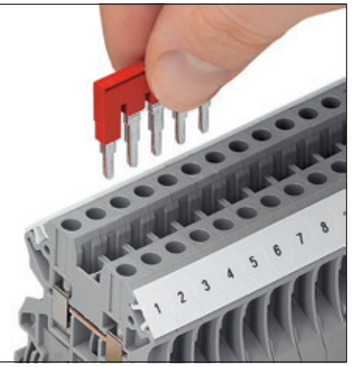


## PT Push-in Technology

- ☑ Push-in Technology, designed by Phoenix Contact
- ☑ Tool-free installation
- ☑ 50% less insertion force, 50% faster to wire
- ☑ Consistent torque-free and vibration-proof connections
- ☑ Wire retention like no other: Performs at 5 times the required IEC pull-out rating
- ☑ Select terminal blocks available in both top and side entry connection styles


## FBS insertion bridging

- ☑ Tool-free installation
- ☑ Dual-bridging channels
- ☑ Skip bridges for distributing two potentials
- ☑ Step bridges for feed-in and distribution blocks
- ☑ Compatible with all CLIPLINE Complete terminal blocks



## Fuse terminal blocks

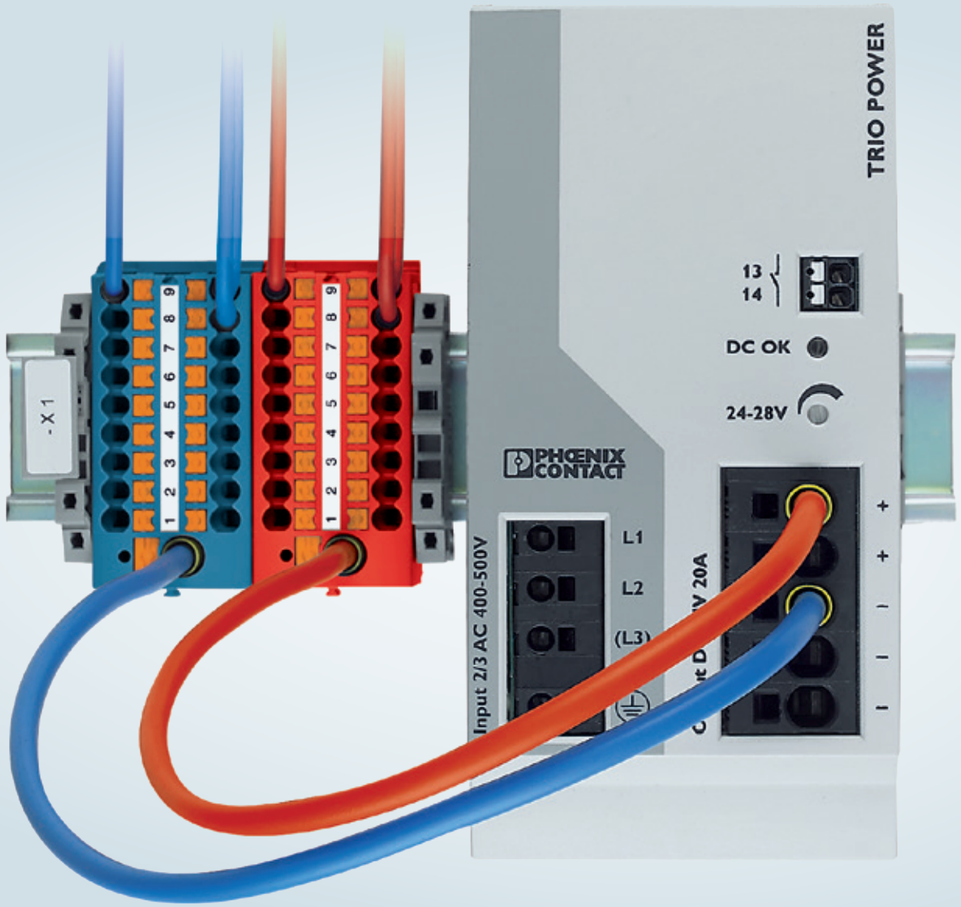
- ☑ Fixed and removable fuse holders
- ☑ Available blown-fuse indicator LED
- ☑ Wide range of sizes and styles
- ☑ Simple power distribution using FBS bridging
- ☑ Optional plug-in circuit breaker modules
- ☑ Multi-level blocks reduce required space

Distribution

# Power distribution modules and solutions

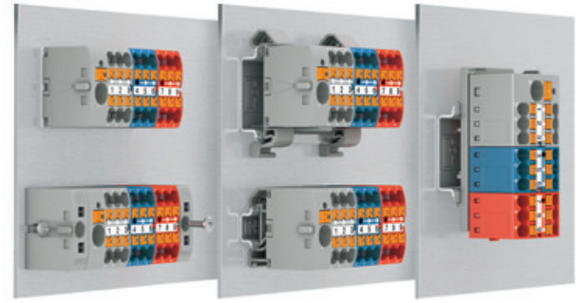
Time is money and multiple part numbers are a hassle. Simplify power distribution with power distribution modules. Power distribution modules are pre-packaged solutions that are designed to save space, time, and part number requirements, all while allowing you to be more productive and your connections to be more reliable.

- Simplified power distribution – reduced component counts and installation times
- Wide range of products – solutions for systems of all sizes and power requirements
- Installation flexibility – multiple mounting options, including DIN rail, direct-mount, and adhesive-mount




## PTFIX

- ☑ Ready-to-use blocks require no bridging
- ☑ Available with or without feed-in terminal
- ☑ Supports up to 8 AWG wire
- ☑ DIN rail, direct, or adhesive mounting
- ☑ Space savings up to 50 percent
- ☑ Available in 11 colors

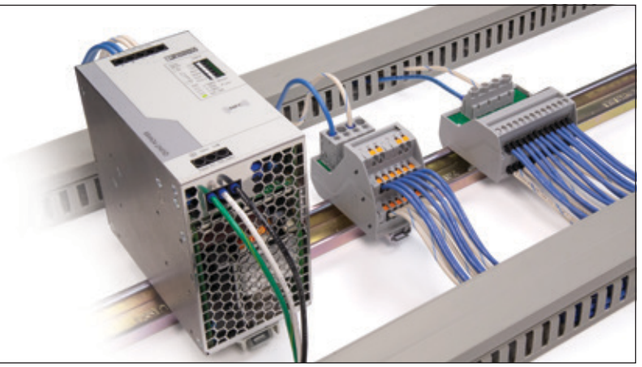


## PTFIX Modular

- ☑ Fully-customizable solution
- ☑ Mix and match feed-thru blocks with power distribution blocks
- ☑ Available in 11 colors
- ☑ Replaces standard terminal block solutions with a smaller footprint and fewer required parts

## VIP power distribution modules

- ☑ Single part number solution
- ☑ Distribute 2 potentials
- ☑ 8-, 12-, 16-, and 24-circuit varieties
- ☑ Compact footprint
- ☑ Reduces installation time up to 47 percent



## DIN rail outlets

- ☑ Single and duplex outlets
- ☑ GFCI outlets available
- ☑ Domestic and global plug types
- ☑ Surface or DIN rail-mounting provides simple installation
- ☑ Easily distribute 120 V AC for plug-connected loads
- ☑ Provides convenience for service and maintenance
- ☑ Designated marking areas
- ☑ Screw or push-in connection technology

# Common products for distribution

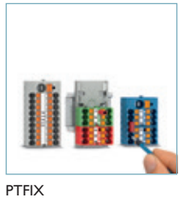
| PTFIX | | | | | |
|---|---|---|---|---|---|
| A. What mounting method is preferred? | | | | | |
| B. What wire size(s) and ratings are needed? | | | | | |
| C. How many connection points? | | | | | |
| D. Resulting Phoenix Contact part number | | | | | |
| **A. Mounting method** | **B. Wire range of terminals** | | **B. UL ratings** | **C. # of terminal points** | **Description** | **D. Order #** |
| | **Taps** | **Feed-in** | | | | |
| Direct mounting w/flange | 26-14 AWG | - | 15 A/300 V | 6 | PTFIX 6X1.5 GY | 3002757 |
| Direct mounting w/flange | 26-14 AWG | - | 15 A/300 V | 12 | PTFIX 12X1.5 GY | 3002758 |
| Direct mounting w/flange | 26-14 AWG | - | 15 A/300 V | 18 | PTFIX 18X1.5 GY | 3002760 |
| 35mm DIN rail | 26-12 AWG | - | 20 A/300 V | 6 | PTFIX 6X2.5-NS35A GY | 3273132 |
| 35mm DIN rail | 26-12 AWG | - | 20 A/300 V | 12 | PTFIX 12X2.5-NS35A GY | 3273154 |
| 35mm DIN rail | 26-12 AWG | - | 20 A/300 V | 18 | PTFIX 18X2.5-NS35A GY | 3273176 |
| 35mm DIN rail, vertical | 26-12 AWG | - | 20 A/300 V | 6 | PTFIX 6X2.5-NS35 GY | 3273000 |
| 35mm DIN rail, vertical | 26-12 AWG | - | 20 A/300 V | 12 | PTFIX 12X2.5-NS35 GY | 3273022 |
| 35mm DIN rail, vertical | 26-12 AWG | - | 20 A/300 V | 18 | PTFIX 18X2.5-NS35 GY | 3273044 |
| 35mm DIN rail | 26-12 AWG | 20-8 AWG | 20 A (Taps), 50 A (Feed-in)/ 300 V | 6 | PTFIX 6/6X2.5-NS35A GY | 3273198 |
| 35mm DIN rail | 26-12 AWG | 20-8 AWG | 20 A (Taps), 50 A (Feed-in)/ 300 V | 12 | PTFIX 6/12X2.5-NS35A GY | 3273220 |
| 35mm DIN rail | 26-12 AWG | 20-8 AWG | 20 A (Taps), 50 A (Feed-in)/ 300 V | 18 | PTFIX 6/18X2.5-NS35A GY | 3273242 |
| 35mm DIN rail, vertical | 26-12 AWG | 20-8 AWG | 20 A (Taps), 50 A (Feed-in)/ 300 V | 6 | PTFIX 6/6X2.5-NS35 GY | 3273066 |
| 35mm DIN rail, vertical | 26-12 AWG | 20-8 AWG | 20 A (Taps), 50 A (Feed-in)/ 300 V | 12 | PTFIX 6/12X2.5-NS35 GY | 3273088 |
| 35mm DIN rail, vertical | 26-12 AWG | 20-8 AWG | 20 A (Taps), 50 A (Feed-in)/ 300 V | 18 | PTFIX 6/18X2.5-NS35 GY | 3273110 |

Note: PTFIX is available in 11 colors and multiple mounting options. For a full overview of PTFIX, visit **www.phoenixcontact.com/PTFIX**

| DIN-mounted receptacles | | | | |
|---|---|---|---|---|
| A. Single or duplex outlet? | | | | |
| B. Standard or GFCI protection? | | | | |
| C. Feed-thru or stand-alone? | | | | |
| D. Resulting Phoenix Contact part number | | | | |
| **A. Single or duplex** | **B. Standard or GFCI** | **C. Feed-thru or stand-alone** | **Type-description** | **D. Order #** |
| 15 A Single | Standard | Stand-alone | EO-AB/UT/LED/15 | 0804155 |
| | | | EO-AB/PT/LED/15 | 0804168 |
| | | Feed-thru | EMG 30-SD/US/15A | 5604253 |
| 15 A Duplex | Standard | Stand-alone | EM-DUO 120/15 | 5600461 |
| | GFCI | Stand-alone | EM-DUO 120/15/GFI | 5600462 |
| | | Feed-thru | EM-DUO 120/15/GFI/AUX | 5600639 |
| 20 A Duplex | Standard | Stand-alone | EM-DUO 120/20 | 5600525 |
| | GFCI | Stand-alone | EM-DUO 120/20/GFI | 5602519 |
| | | Feed-thru | EM-DUO 120/20/GFI/AUX | 5603049 |

| VIP power distribution modules (PDMs) | | | | |
|---|---|---|---|---|
| A. PT or screw? | | | | |
| B. Number of circuits? | | | | |
| C. Fusing required? | | | | |
| D. Resulting Phoenix Contact part number | | | | |
| **A. Termination type** | **B. Number of circuits** | **C. Fusing** | **Type-description** | **D. Order #** |
| Screw terminal | 8 | No | VIP-2/SC/PDM-2/16 | 2315256 |
| | 12 | No | VIP-2/SC/PDM-2/24 | 2315269 |
| | 16 | No | VIP-2/SC/PDM-2/32 | 2315272 |
| | 32 | No | VIP-2/SC/PDM-2/48 | 2903717 |
| PT Push-in terminal | 8 | No | VIP-3/PT/PDM-2/16 | 2903797 |
| | 8 | Yes | VIP-2/PT/PDM-2/16/FU 6.3A | 2903603 |
| | 12 | No | VIP-3/PT/PDM-2/24 | 2903798 |
| | 16 | No | VIP-3/PT/PDM-2/32 | 2903799 |
| | 24 | No | VIP-3/PT/PDM-2/48 | 2903800 |

Terminal blocks



PTFIX

PDMs

DIN rail outlets

| Modular terminal blocks | |
|---|---|
| A. What connection style best fits your application? | E. Resulting Phoenix Contact part number |
| B. What wire size are you using? | F. End-cover accessory |
| C. What is your current (amps) requirement? | G. Will you be bridging terminals? |
| D. How many connection points? | H. What accessories are needed? |

**A. Push-in Technology (PT)**

| B. AWG | C. I_max | D. Connections | Description | E. Order # | F. Cover | G. Bridge (2-pos.) | H. Screwdriver | H. Terminal marking |
|---|---|---|---|---|---|---|---|---|
| 26-12 | 20 | 2 | PTV 2.5 | 1078960 | 1079914 | 3030161 | 1204517 | 828744 |
| | 20 | 3 | PTV 2.5-TWIN | 1078966 | 1079916 | | | |
| | 20 | 4 | PTV 2.5-QUATTRO | 1078999 | 1079917 | | | |
| | / | 2 | PTV 2.5-PE | 1078963 | 1079914 | | | |
| 26-12 | 20 | 2 | PT 2.5 | 3209510 | 3030417 | 3030161 | 1204517 | 0828744 |
| | - | | PT 2.5-PE | 3209536 | | | | |
| | 20 | 3 | PT 2.5-TWIN | 3209549 | 3030488 | | | |
| | 20 | 4 | PT 2.5-QUATTRO | 3209578 | 3030514 | | | |
| | 20 | | PTTB 2.5 | 3210567 | 3211634 | | | |
| | - | | PTTB 2.5-PE | 3210596 | | | | |
| 24-10 | 30 | 2 | PT 4 | 3211757 | 3030420 | 3030336 | 1204517 | 0828746 |
| | - | | PT 4-PE | 3211766 | | | | |
| | 6.3 | | PT 4-HESI (5X20 FUSE) | 3211861 | | | | |
| | 6.3 | | PT 4-HESILED 24 (5X20 FUSE) | 3211903 | | | | |
| | 30 | 3 | PT 4-TWIN | 3211771 | 3208977 | | | |
| | 30 | 4 | PT 4-QUATTRO | 3211797 | 3208979 | | | |
| | 28 | | PTTB 4 | 3211786 | 3030462 | | | |
| | - | | PTTB 4-PE | 3211854 | | | | |

* 18 AWG max, using plastic insulated ferrule. See UL file for use group rating

**A. Screw clamp (UT)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 26-12 | 20 | 2 | UT 2.5 | 3044076 | 3047028 | 3030161 | 1212587 | 0828734 |
| | - | | UT 2.5-PE | 3044092 | | | | |
| | 20 | 3 | UT 2.5-TWIN | 3044513 | 3047141 | | | |
| | 20 | 4 | UT 2.5-QUATTRO | 3044542 | 3047170 | | | |
| | 20 | | UTTB 2.5 | 3044636 | 3047293 | | | |
| | - | | UTTB 2.5-PE | 3044665 | 3047293 | | | |
| | 20 | 6 | UT 2.5-3L | 3214259 | 3214314 | | | |
| | - | | UT 2.5-3PE | 3214275 | | | | |
| 26-10 | 30 | 2 | UT 4 | 3044102 | 3047028 | 3030336 | 1212587 | 0828736 |
| | - | | UT 4-PE | 3044128 | | | | |
| | 6.3 | | UT 4-HESI (5X20 FUSE) | 3046032 | - | | | |
| | 6.3 | | UT 4-HESILED 24 (5X20 FUSE) | 3046090 | - | | | |
| | 30 | 3 | UT 4-TWIN | 3044364 | 3047141 | | | |
| | 30 | 4 | UT 4-QUATTRO | 3044571 | 3047170 | | | |
| | 30 | | UTTB 4 | 3044814 | 3047293 | | | |
| | - | | UTTB4-PE | 3044759 | | | | |
| 26-8 | 50 | 2 | UT-6 | 3044131 | 3047028 | 3030284 | 1205066 | 0828740 |
| | - | | UT6-PE | 3044157 | | | | |

**A. Spring cage (ST)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 28-12 | 20 | 2 | ST 2.5 | 3031212 | 3030417 | 3030161 | 1204517 | 0828744 |
| | 20 | 4 | ST 2.5-QUATTRO | 3031306 | 3030514 | | | |
| 28-10 | 30 | 2 | ST 4 | 3031364 | 3030420 | 3030336 | 1204517 | 0828746 |
| | 6.3 | 2 | ST 4-HESILED 24 (5X20 FUSE) | 3036547 | - | | | |

**A. Insulation displacement (IDC)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 24-16 | 10 | 2 | QTC 1.5 | 3205019 | 3205161 | 3030161 | 1204517 | 0828744 |
| | 10 | 4 | QTC 1.5-QUATTRO | 3205077 | 3205174 | | | |
| 20-14 | 15 | 2 | QTC 2.5 | 3206416 | 3206568 | 3030336 | 1204517 | 0828746 |
| | 15 | 4 | QTC 2.5-QUATTRO | 3206446 | 3206449 | | | |
| | 6.3 | 2 | QTC 2.5-HESILED 24 (5X20 FUSE) | 3050374 | 3206571 | | | |

**A. Bolt connection (RT)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 26-14 | 24 | 2 | RT-3 | 3049013 | 3049097 | 3030336 | 1205053 | 0828740 |
| 26-10 | 41 | 2 | RT-5 | 3049026 | | 3030284 | 1205079 | 0829144 |
| 14-2 | 125 | 2 | RT-8 | 3049042 | 3049194 | 3005947 | 1205066 | - |

LIMITED LIFETIME
**WARRANTY**

BUILD WITH CONFIDENCE

## Build with confidence

Our Limited Lifetime Warranty is our promise to you that the products you install in your control cabinets are built to last. In industry and infrastructure, we stand with you. Simply register and relax. Isn't it time you trusted Phoenix Contact to build your cabinet confidence?

Register today at: **www.phoenixcontact.com/LLW**


# Ongoing communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for our future-oriented components, systems, and solutions in the fields of electrical engineering, electronics, and automation. With a global network reaching across more than 100 countries with over 17,400 employees, we stay in close contact with our customers, something we believe is essential for success.

Our wide variety of innovative products makes it easy for our customers to find future-oriented solutions for multiple applications and industries. We focus predominantly on the fields of energy, infrastructure, process, and factory automation.

You can find your local partner at

## www.phoenixcontact.com

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INSPIRING INNOVATIONS

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